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## Circumcision in the United States

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**Abstract:** The circumcision status of boys aged 12 through 17 years (born from 1949 to 1958) from a sample cohort of the National Health Examination Survey (NHES) cycle III, conducted from 1966-70, was analyzed. Over three-fourths of the cohort had been circumcised, reflecting circumcision practices in the 1950s. Prevalence of circumcision was more common in Whites, in families with higher income, and higher educated heads of household. Circumcision prevalence was the lowest in the South and highest in the Midwest. More recent national data are not available. (*Am J Public Health* 1985; 75:878-880.)

### Introduction

Routine circumcision of newborn boys has been the subject of controversy for several decades.<sup>1-3</sup> Despite the sometimes passionate rhetoric for and against the practice, few data exist that document circumcision practices in the United States.

We investigated the prevalence of circumcision in boys 12 through 17 years of age in the United States using data from cycle III of the National Health Examination Survey (NHES).

### Methods

The history, general plan, and operation of the NHES are described elsewhere.<sup>4-7</sup> NHES cycle III was conducted from March 1966 to March 1970. The survey sampling plan followed a multistage, stratified probability sample of clusters of households from which a sample of the noninstitutionalized US population aged 12 through 17 years was selected. A detailed discussion of the survey design is

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reported elsewhere.<sup>8</sup> Of the 7,514 youths selected for the sample cohort, 6,768 (90 per cent) were examined by the NHES team.

#### Interview and Examination

Each youth was examined by a physician, dentist, psychologist, and trained technicians. The physician noted and recorded whether or not the boy had been circumcised; no attempt was made to assess the date of circumcision. Questions relating to family income, education of parents, and similar demographic information were answered by the parent during an interview administered in the home before the examination.

Race was defined as "White", "Black", and "other races." Because so few youths of "other races" were in the sample, their data were not analyzed separately; in the analyses of factors other than race, the "other races" are included. The age interval was 12.00 through 17 years at time of selection for examination. The value used as label in the Tables is age at last birthday, the value used for all calculations is mean age of the group, thus "14 years old" means all children 14.00 to 14.99 years with an average value of 14.49 years.

Income is combined annual family income from all members of the household reported by the respondent. Education of parent or guardian was recorded as the highest grade that had been completed in school. Education in vocational, trade, or business schools outside the regular school system was not counted in determining the highest grade completed in school.

#### Statistical Methods

All data are based on weighted observations, that is, data for each sample youth are inflated in the estimation process to characterize the larger universe of which the sample youth is representative. The weights included an adjustment for non-response cases and a post stratified ratio adjustment.<sup>9</sup> Standard errors have been calculated by a balanced repeated replication technique,<sup>10</sup> a specialized technique necessitated by the complexity of the NHES sample design.

Two types of hypothesis testing were used: the first was the z-test for proportions; the second was Spearman's rank correlation coefficient.

**TABLE 1—Weighted Numbers, Percentages, and Standard Errors of Youths Circumcised, by Age and Race, United States, 1966–70**

				Race		
Age in Years	N	Total Per Cent (S <sub>p</sub> )	N	White Per Cent (S <sub>p</sub> )	N	Black Per Cent (S <sub>p</sub> )
12	1565	77.1 (2.69)	1414	80.9 (3.03)	146	52.6 (4.21)
13	1549	77.3 (2.26)	1417	82.1 (2.46)	120	45.8 (5.50)
14	1514	77.6 (2.73)	1398	82.9 (2.98)	113	44.0 (8.76)
15	1427	74.6 (2.88)	1324	79.8 (3.08)	91	37.7 (5.29)
16	1354	73.8 (2.87)	1262	79.2 (3.25)	88	38.1 (5.00)
17	1303	73.9 (2.70)	1178	77.1 (2.92)	114	50.8 (4.68)
12-17	8713	75.8 (2.28)	7993	80.4 (2.48)	672	50.8 (3.29)

N = weighted sample size, in thousands, of circumcised youths.

Per cent = per cent of youths circumcised.

S<sub>p</sub> = standard error of the per cent of circumcised youths.

**TABLE 2—Weighted Numbers, Percentages, and Standard Errors of Youths Circumcised 12–17 Years of Age, by Race and Region, United States 1966–70**

Region	N	Total % (S <sub>p</sub> )	N	Race		
				White % (S <sub>p</sub> )	N	Black % (S <sub>p</sub> )
Northwest	2056	80.8 (2.36)	1867	82.6 (2.92)	189	68.2 (4.20)
Midwest	2798	85.7 (2.69)	2639	88.8 (3.44)	143	51.5 (4.37)
South	1709	62.5 (5.62)	1483	73.8 (5.71)	226	31.2 (4.56)
West	2151	72.7 (5.92)	2004	74.2 (6.46)	115	53.5 (7.42)

N = weighted sample size, in thousands, of circumcised youths.

% = per cent of youths circumcised.

S<sub>p</sub> = standard error of the per cent of circumcised youths.

#### Results

The estimated number and percentage of youths in each of the six age groups who had been circumcised are shown in Table 1. There was no age effect within this limited age range; the subsequent data are not reported by age. Approximately 76 per cent of adolescent youths had been circumcised, 80 per cent of White males and 45 per cent of Black males.

As shown in Table 2, independently of race, fewer youths were circumcised in the South than in the Midwest, while the Northeast and West fell between these extremes.

The estimated percentages of youths circumcised according to family income are shown in Table 3. For Whites, family income was highly correlated ( $r = .82$ ) with the prevalence of circumcision. Except for the two lowest income categories, the percentage of all youths circumcised increased with increasing family income, from a low of 39 per cent to a high of 94.1 per cent. Among Whites with the highest incomes, almost all the sons were circumcised. For Blacks, this strong relationship between family income and prevalence of circumcision is not seen.

Table 4 shows that the percentage of youths circumcised by race is directly related to education of head of household. The trend for Black and White youths was similar, but more marked for Whites.

**TABLE 3—Weighted Numbers, Percentages, and Standard Errors of Youths Circumcised by Race and Annual Family Income, United States, 1966–70**

Annual Family Income (in dollars)	N	Total Per Cent (S <sub>p</sub> )	Race			
			White Per Cent (S <sub>p</sub> )	N	Black Per Cent (S <sub>p</sub> )	(S <sub>p</sub> )
<1000	102	45.1 (6.09)	77	75.4 (7.17)	24	—
1000–1999	202	52.0 (7.73)	149	58.4 (13.26)	53	39.8 (9.02)
2000–2999	255	39.5 (7.69)	167	40.4 (10.27)	88	38.1 (7.89)
3000–3999	427	57.4 (5.48)	310	60.9 (9.05)	114	49.0 (6.29)
4000–4999	488	61.4 (4.96)	380	61.1 (5.86)	101	59.2 (7.55)
5000–6999	1239	71.7 (2.41)	1116	75.5 (2.37)	116	48.9 (7.23)
7000–9999	2326	83.6 (1.94)	2215	86.0 (1.88)	93	50.8 (11.13)
10000–14999	1891	89.7 (1.72)	1859	91.2 (1.73)	32	48.4 (10.9)
≥15000	1212	94.1 (1.30)	1194	95.1 (1.31)	6	—

N = weighted sample size, in thousands, of circumcised youths.

Per cent = per cent of youths circumcised.

S<sub>p</sub> = standard error of the per cent of circumcised youths.

— = unreliable data.

**TABLE 4—Weighted Numbers, Percentages and Standard Errors of Youths Circumcised by Race and Education of Head of Household, United States, 1966–70**

Education of Head of Household (in years)	Race							
	Total			White			Black	
	N	Per Cent	(S <sub>p</sub> )	N	Per Cent	(S <sub>p</sub> )	N	Per Cent (S <sub>p</sub> )
1–4	252	34.9	(7.92)	179	35.6	(11.07)	73	33.4 (8.21)
5–7	451	46.3	(5.73)	345	51.7	(7.69)	102	33.8 (4.56)
8	958	69.2	(3.28)	880	72.2	(3.93)	63	43.3 (7.13)
9–11	1753	74.9	(2.39)	1561	82.0	(2.31)	184	43.2 (6.91)
12	2820	85.6	(1.53)	2657	87.4	(1.60)	154	62.7 (4.29)
13–15	858	89.0	(1.85)	834	90.8	(2.14)	24	— —
16	721	91.4	(2.33)	703	92.5	(2.25)	17	— —
≥17	692	93.2	(1.57)	660	94.4	(1.21)	20	— —

N = weighted sample size, in thousands, of circumcised youths.

Per cent = per cent of youths circumcised.

— = unreliable data.

Ninety-seven per cent of White boys and 89 per cent of Black boys were born in hospital. For Whites, 84 per cent of the hospital-born were circumcised, whereas only 32.9 per cent of those not born in hospital were circumcised. For Blacks, the comparable figures are 54 per cent and 19.6 per cent, respectively.

### Discussion

The data presented are from a national probability survey of boys born between 1949 and 1958. However, the sample is not a statistical sample of the cohort. It can be thought of most accurately as a cohort with a mean birth date centered in 1953 and extended two and one-half years earlier and later.

The results given here are therefore a reflection of circumcision practices in the early 1950s. These results also can be used to specify information on the cohort as it ages and experiences diseases that have been etiologically associated with lack of circumcision, such as penile carcinoma, cancer of the prostate, and cancer of the cervix.<sup>11</sup>

Information on circumcision practices in the US is not routinely collected or reported. Circumcision data collected by NHES was not continued into the later health and nutrition examination surveys, NHANES I and II.

More appears to be known about circumcision practices of other countries.<sup>11</sup> Surveys in Great Britain,<sup>12</sup> show that, whereas 22.7 per cent of the boys born in 1946 were circumcised by age 11, only 10.9 per cent of those born in 1958 were circumcised. There were regional and occupational differences in the prevalence; the latter pattern is similar to the income-education gradient we found in the US data.

Without more recent data, it is difficult to know whether the recommendations of the American Academy of Pediatrics in 1971 that there are no valid medical indications for circumcision in the newborn period,<sup>13</sup> or the reiteration of this attitude in 1974<sup>14</sup> have had any influence on US practices.

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